

REMARKS

Claims 1-12 and 28-44 were pending in the present application. By virtue of this amendment, claims 1, 9-12, and 39-44 have been amended, and claims 45-58 added. Accordingly, claims 1-12, 28-58 are currently under consideration. Amendment and cancellation of certain claims is not to be construed as a dedication to the public of any of the subject matter of the claims as previously presented.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attachment is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

New Claims

New claims 45-58 have been added. Support for the claims can be found in the present application, for example, from page 53, line 4 to page 56, line 11, and Figs. 8-11. Accordingly, no new matter has been added.

Priority

The Examiner has acknowledged Applicants' claim for priority under 35 U.S.C. § 119(e) in paragraph 3 of the Office Action. The Examiner stated, however, *inter alia*, that Provisional Application No. 60/175,255 (hereinafter, "'255'") "do[es] not teach or describe the ratio of length to width of the substrate as recited in Claims 9-12."

Applicants do not necessarily agree that claims 9-12 are not supported in the '255 Provisional Application. In light of the following remarks, however, it is not necessary to address the support for claims 9-12.

Rejections under 35 U.S.C. §112, second paragraph

Claims 8-12 and 39-44 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, the following rejections were made.

A. Claims 8-12

Claims 8-12 stand rejected “for the recitation ‘the ratio’ because ‘ratio’ lacks proper antecedent basis in Claim 1.” Office Action, ¶ 5a.

Applicants believe that the Examiner has mistakenly included claim 8 in this rejection as claim 8 does not include the language “the ratio.” Applicants believe the rejection should properly stand against claims 9-12. Applicants have amended claims 9-12 as indicated in the above amendment and request withdrawal of the rejection.

B. Claims 39-41

Claims 39-41 stand rejected “for the recitation ‘the probe can bind to a target’ because it is unclear what limitation the recitation imposes upon the probe. It is suggested that Claims 39-41 be amended to clarify e.g. replace ‘can bind to’ with ‘is a binding partner for’.” Office Action, ¶ 5b.

Applicants submit that the language of claims 39-41, i.e., “the probe can bind to a target,” is sufficiently clear and definite, however, to further prosecution Applicants have amended claims 39-41 as suggested by the Examiner. Applicants believe the amendment to claims 39-41 have not changed the scope of the claims and is not a narrowing amendment.

C. Claims 42-44

Claims 42-44 stand rejected for the recitation “the probe carrier” because “probe carrier” lacks proper antecedent basis in Claims 1, 28, 30 and 33.” Office Action, ¶ 5c.

Applicants have amended claims 42-44 as indicated in the above amendment and request withdrawal of the rejection.

Rejections under 35 U.S.C. §102

A. Claims 1, 6, 7, 9, 28, 30, and 33-44

Claims 1, 6, 7, 9, 28, 30, and 33-44 stand rejected under 35 U.S.C. § 102(b) as being anticipated by *BioTechniques*, 1998, 25(5): 886-890 by Stimpson et al. (hereinafter "Stimpson").

Applicants submit that Stimpson does not disclose or suggest the subject matter of claim 1 as amended. In particular, Stimpson does not disclose or suggest an apparatus for allowing specific identification of samples with probes as otherwise specified in claim 1 and "wherein the flexible elongated substrate is coiled with overlapping portions and non-overlapping portions, and said probes are present on said non-overlapping portions." As described in the present application, for example, on page 53, line 4 to page 56, line 11, and Figs. 8-11, the substrate may be coiled or spiraled with overlapping portions and non-overlapping portions, and the probes are present on the non-overlapping portions. As seen in further detail in Figs. 8 and 10c, the probes are included on the non-overlapping portions, where the overlapping portions include, for example, the adjacent surfaces of the substrate. Accordingly, no new matter has been added by the amendment.

In contrast to claim 1, Stimpson discloses that the probes are printed on one side of a membrane that is then wrapped upon itself and sliced into individual slabs. Stimpson, page, 887, left and center column, and Fig. 1. Reagents are then placed on top of the array and allowed to flow through the slab or the entire slab is soaked in a solution of reagents. Stimpson, page 887, left and center column. Stimpson discloses that the probes are present only on the overlapping portions of the substrate, and does not disclose that the probes are present on the non-overlapping portions. For example, it is not disclosed that the probes are present on the top or bottom of the slab as shown in part C of Figure 1 of Stimpson. The act of cutting the slab creates a new surface that does not have probes thereon. Further, it is indicated that they are indeed not present on the top or bottom surface of the slab because reagents are either allowed to flow through the

slab or the entire slab is soaked in the various solutions to bring the reagents in contact with probes. Therefore, Stimpson does not disclose or suggest the elements of claim 1.

Claims 6, 7, 9, 28, 30, and 33-44 depend from claim 1 and should be allowable over Stimpson for at least the same reasons. Applicants therefore request withdrawal of the rejection.

B. Claims 1-4, 6-9, 28, 30, and 33-44

Claims 1-4, 6-9, 28, 30, and 33-44 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,037,186 issued to Stimpson et al. (hereinafter "Stimpson '186").

Applicants submit that Stimpson '186 does not disclose or suggest the subject matter of claim 1 as amended. In particular, Stimpson '186 does not disclose or suggest an apparatus for allowing specific identification of samples with probes "wherein the flexible elongated substrate is coiled with overlapping portions and non-overlapping portions, and said probes are present on said non-overlapping portions."

As seen in Figs. 2A-2E of Stimpson '186, probes are positioned in lanes of the substrate that is wound upon itself and cut into slabs with the probes present on the overlapping portions, i.e., within the lanes 230 that are wound upon itself. Similar to the Stimpson reference discussed above, Stimpson '186 describes using the slab by drawing a liquid "into the array by capillary action," to interact with the probes on the substrate, i.e., on the lanes 230. Stimpson '186, col. 6, lines 8-20. Alternatively, the array can be soaked in a sample liquid such that a binding reaction occurs "by diffusion of target molecules to the surface of the array or into the matrix of the array." Stimpson '186, col. 6, lines 20-26. Stimpson '186 does not disclose, however, that the non-overlapping portions, i.e., the portions that have been cut, contain probes on the substrate surface. The act of cutting the slab creates a new surface that does not have probes thereon. Further, the description of using the slab indicates that the probes are contained only within the overlapping portions of the substrate. Therefore, Stimpson '186 does not disclose or suggest the elements of claim 1.

Claims 2-4, 6-9, 28, 30, and 33-44 depend from claim 1 and should be allowable over Stimpson '186 for at least the same reasons. Applicants therefore request withdrawal of the rejection.

C. Claims 1, 6-8, 28-33, and 35-44

Claims 1, 6-8, 28-33, and 35-44 stand rejected under 35 U.S.C. § 102(b) as being anticipated by PCT Publication No. WO 99/39186, published 5 August 1999 to Siegesmund (hereinafter "Siegesmund").

Initially, Applicants submit that Siegesmund is not prior art 35 under U.S.C. § 102(b) because Siegesmund was not published more than one year prior to January 10, 2000. Applicants respond to this rejection as properly falling under 35 U.S.C. § 102(a).

Applicants submit that Siegesmund does not disclose or suggest the subject matter of claim 1 as amended. In particular, Siegesmund does not disclose or suggest an apparatus for allowing specific identification of samples with probes "wherein the flexible elongated substrate is coiled with overlapping portions and non-overlapping portions, and said probes are present on said non-overlapping portions."

The movable support 12 of Siegesmund can be provided on a delivery spool 24 and a take-up spool 26, however, there is no disclosure or suggestion that probes are present on the non-overlapping portion of support 12 while support 12 is contained on spool-24 or 26. As seen in Figure 1 of Siegesmund, identification of samples takes place while support 12 is transferred from spool 24 to spool 26, and as described on page 14, line 23-28 of Siegesmund, the support can be stored on the take-up reel for extended periods of time because the "sandwich complexes" are stable and persistent. This suggests that probes are present only in the overlapping portions of the support. Therefore, Siegesmund does not disclose or suggest the elements of claim 1.

Claims 6-8, 28-33, and 35-44 depend from claim 1 and should be allowable over Siegesmund for at least the same reasons. Applicants therefore request withdrawal of the rejection.

D. Claims 1-7, 28-33, and 35-44

Claims 1-7, 28-33, and 35-44 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application Publication No. 2001/0031495 A1 filed March 8, 2001 as a non-provisional application of provisional application 60/188,978 filed on March 13, 2000 to Tajima (hereinafter "Tajima").

The present application claims the benefit of U.S. Application No. 60/175,222 filed on January 10, 2000 (hereinafter "'222"). Claim 1 is supported by the provisional application '222, for example, on pages 2 and 3 and also with Figures 2 and 3. Therefore, the effective filing date for claim 1 is January 10, 2000, prior to the filing date of Tajima. Applicants therefore request withdrawal of the rejection.

Claims 2-7, 28-33, and 35-44 depend from claim 1 and should be allowable over Tajima for at least the same reasons as claim 1. Applicants therefore request withdrawal of the rejection.

Rejections under 35 U.S.C. §103

A. Claims 5 and 10-12

Claims 5 and 10-12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Stimpson '186.

Applicants submit that claims 5 and 10-12 are allowable at least because of their dependency on claim 1. Specifically, Stimpson '186 does not disclose or suggest all the elements of claim 1 as discussed above.

B. Claims 29, 31, and 32

Claims 29, 31, and 32 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Stimpson '186 in view of PCT Publication No. WO 97/46313, published 11 December 1997 to Heynekder (hereinafter "Heynekder").

Claims 29, 31, and 32 depend from claim 1 and should be allowable for at least the same reasons as claim 1. The combination of Heynekder with Stimpson '186 does not cure the deficiencies of Stimpson '186 discussed above.

Further, the Examiner states, *inter alia*, that:

Stimpson et al (a) teach the apparatus of Claim 1 ... but they do not teach the substrate comprises a thread. However, thread substrates were well known and routinely practiced in the art at the time the claimed invention was made as taught by Heynekder (page 9, lines 12-25). It would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to apply the thread substrates about the spool drum because the wrapped threads would eliminate the substrate slicing in the method of Stimpson et al. Specifically, the substrate sheet of Stimpson et al is wrapped about the spool and then sliced to provide multiple substrates (Column 9, lines 8-16). Using a thread substrate would simplify the apparatus of Stimpson et al by eliminating the slicing step which separates substrate into multiple substrates because the thread substrates are separate from each other. Therefore, one skilled in the art would have been motivated to apply the thread substrates of Heynekder to the apparatus of Stimpson et al for the obvious benefits of eliminating the unnecessary step of slicing.

Applicants submit that the Examiner has not presented a *prima facie* case of obviousness. Specifically, the Examiner has not identified any teaching, suggestion, or motivation in the prior art for the proffered combination. MPEP 2143. The Examiner's determination that one skilled in the art would be motivated to use a thread substrate because it eliminates the unnecessary step of slicing, does not provide a sufficient teaching, suggestion, or motivation for the combination to meet the elements of claim 1 without an explanation of where such a motivation is found in the prior art or the knowledge of one skilled in the art. Such a finding is particularly important because, contrary to the Examiner's assertion, the act of slicing the wound substrate is a desirable step of Stimpson '186. The disclosure of Stimpson '186 describes forming an array cut from porous sheets to conduct the flow of liquid through the multitude of edges exposed during cutting. Stimpson '186, col. 3, lines 36-46. Thus, the act of cutting creates the desired conditions of the slab described by Stimpson '186, i.e., the exposed edges of the porous sheets. Id.

Further, using a thread substrate with Stimpson '186 would impermissibly change the principle of operation of Stimpson. See, MPEP 2143.01 (A proposed modification cannot change the principle of operation of a reference). The principle of operation of Stimpson '186 includes the winding the substrate and slicing arrays therefrom, and allowing fluids to flow through the arrays to the probes. The combination proposed by the Examiner to meet claim 1 would change this principle of operation.


Accordingly, Applicants request withdrawal of the rejection.

CONCLUSION

In the unlikely event that the transmittal letter is separated from this document and the Patent Office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Assistant Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing docket no. **473532000100**. However, the Assistant Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

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Respectfully submitted,

By: 
Christopher B. Eide
Registration No. 48,375

Morrison & Foerster LLP
755 Page Mill Road
Palo Alto, California 94304-1018
Telephone: (650) 813-5720
Facsimile: (650) 494-0792

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

Claims 1, 9-12, and 39-44 have been amended as follows:

1. (Amended) An apparatus for allowing specific identification of samples with probes, comprising

a flexible elongated substrate having a first substrate surface, a length, and a width; and
a plurality of non-identical probes immobilized on discrete areas of a probe-containing portion of the substrate surface, each of said discrete areas containing one probe,

wherein the flexible elongated substrate is coiled with overlapping portions and non-overlapping portions, and said probes are present on said non-overlapping portions.

9. (Amended) The apparatus of claim 1 wherein [the] a ratio of the length to the width of the substrate exceeds 5:1.

10. (Amended) The apparatus of claim 1 wherein [the] a ratio of the length to the width of the substrate exceeds 100:1.

11. (Amended) The apparatus of claim 1 wherein [the] a ratio of the length to the width of the substrate exceeds 10,000:1.

12. (Amended) The apparatus of claim 1 wherein [the] a ratio of the length to the width of the substrate exceeds 100,000:1.

39. (Amended) An apparatus according to claim 28 wherein the probe [can bind to] is a binding partner for a target selected from the group consisting of polynucleotides,

oligonucleotides, proteins, polypeptides, oligosaccharides, antibodies, cell receptors, ligands, lipids, cells, and combinations thereof.

40. (Amended) An apparatus according to claim 30 wherein the probe [can bind to] is a binding partner for a target selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, oligosaccharides, antibodies, cell receptors, ligands, lipids, cells, and combinations thereof.

41. (Amended) An apparatus according to claim 33 wherein the probe [can bind to] is a binding partner for a target selected from the group consisting of polynucleotides, oligonucleotides, proteins, polypeptides, oligosaccharides, antibodies, cell receptors, ligands, lipids, cells, and combinations thereof.

42. (Amended) An apparatus according to claim 28 wherein the [probe carrier] substrate comprises a [substrate] material selected from the group consisting of silica, glass, optical fibers, metals, magnetizable metals, plastics, polymers, polyimide, and polytetrafluoroethylene.

43. (Amended) An apparatus according to claim 30 wherein the [probe carrier] substrate comprises a [substrate] material selected from the group consisting of silica, glass, optical fibers, metals, magnetizable metals, plastics, polymers, polyimide, and polytetrafluoroethylene.

44. (Amended) An apparatus according to claim 33 wherein the [probe carrier] substrate comprises a [substrate] material selected from the group consisting of silica, glass,

optical fibers, metals, magnetizable metals, plastics, polymers, polyimide, and polytetrafluoroethylene.

Claims 45-58 are new.